SuMIRe – PFS

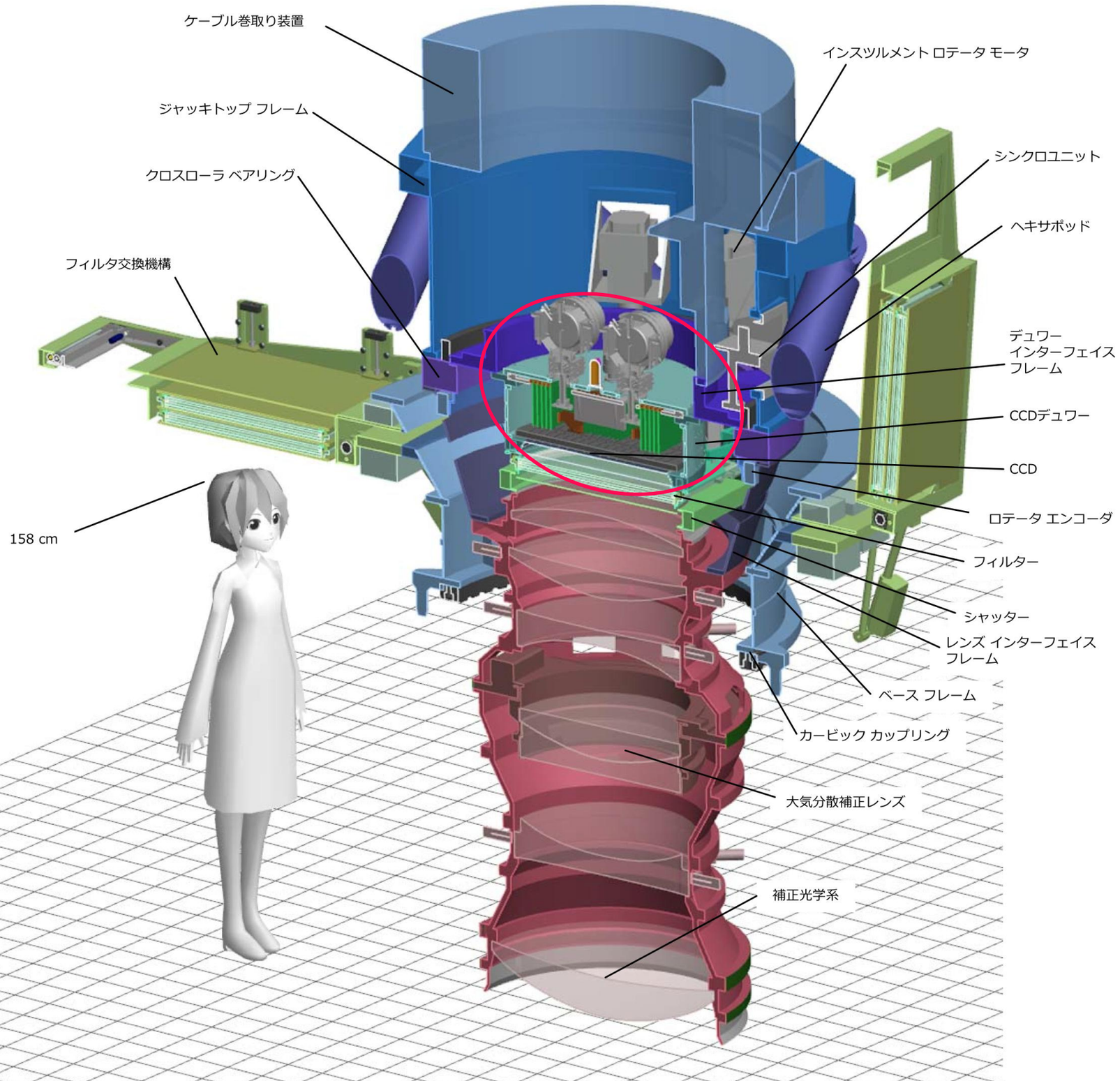
概要、現在の仕様、技術開発、予算、スケジュールなど

Hiroshi Karoji @　IPMU

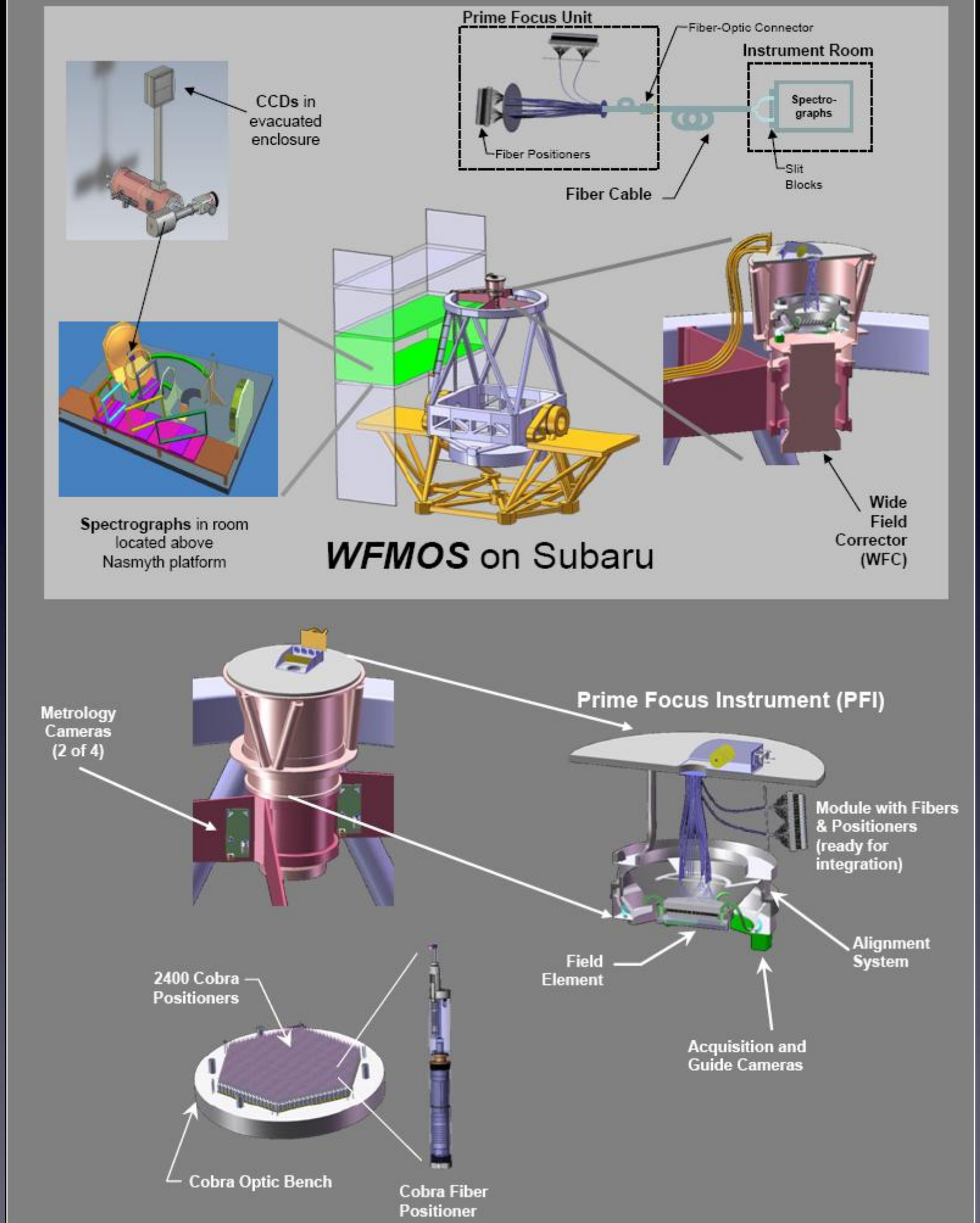
SuMIRe-PFS計画の特色

- 「最先端プログラム」からスタート
  - ⇒ “年度” なしで2010/13 の 4 年間
- HSCへの巨額投資をそのまま活用
  - ⇒ 補正光学系、Prime Focus Unit
- Gemini/Caltech/JPLのdesign studyがある
  - ⇒ すばる、Gemini ともgo sign 直前
  - ⇒ しかし、高すぎる
- 装置製作の（潜在的）国際 partners が実在
  - ⇒ Gemini study の遺産

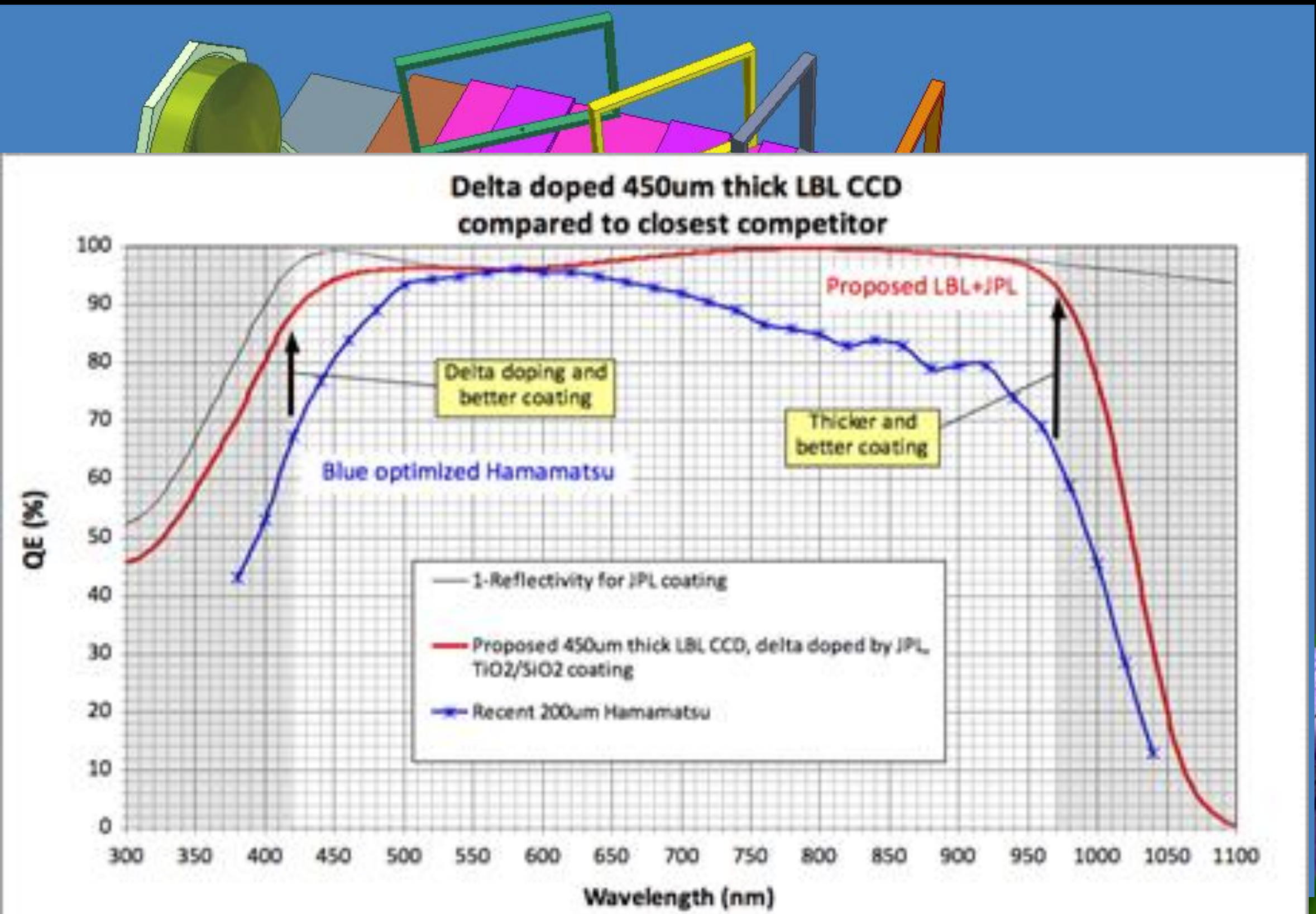
What should be swapped?

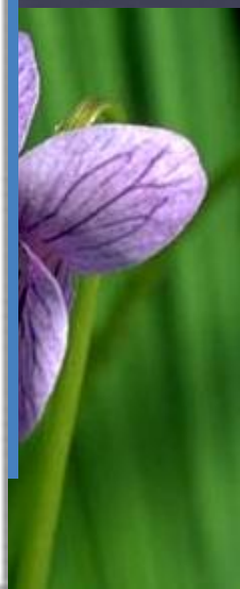


What should be installed?



What is SuMIRe's PFS ?

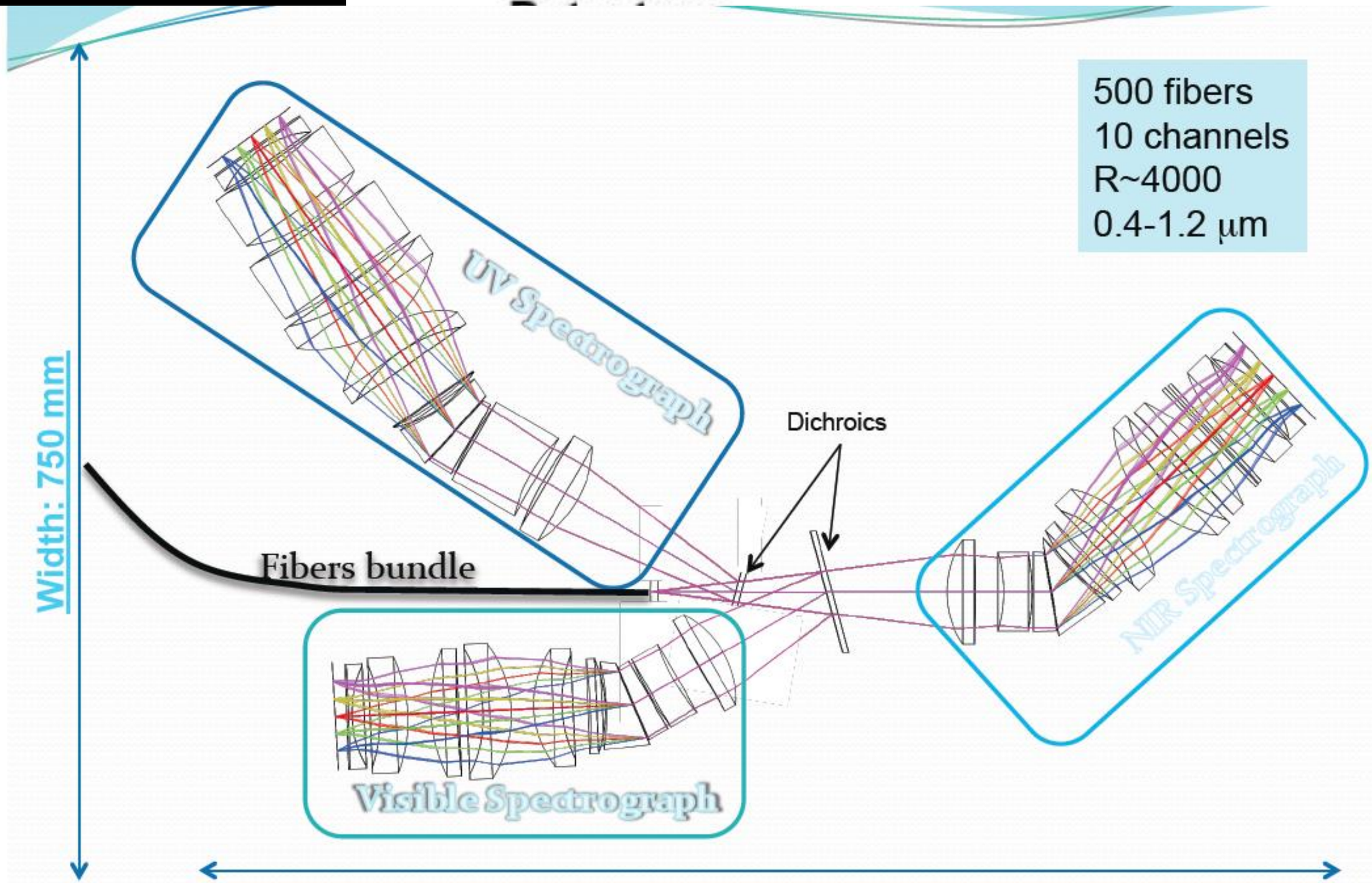




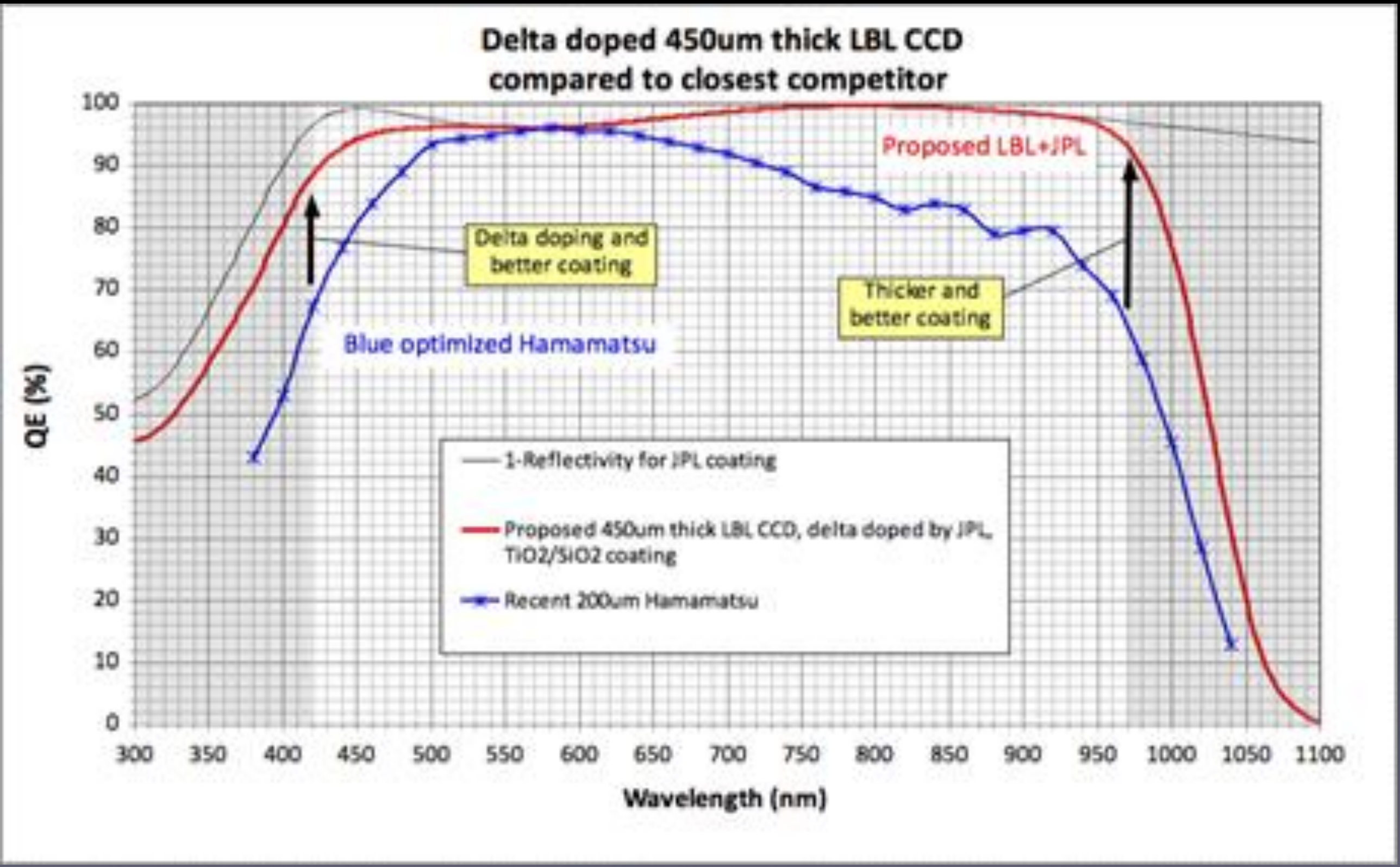
Top-Level WBS *Revised*

WBS Element	Institution(WFMOS)	⇨SuMIRe PFS
1.0 Science	Caltech/JPL	Japan
2.0 Management	JPL	Japan
3.0 System Engineering	JPL	Japan/JPL :
4.0 Instrument System		
4.1 Spectrograph	Cambridge	Marseille
4.2 Positioner	JPL/PSU	JPL
4.3 Detector System	Caltech/JPL	Princeton
4.4 Fiber System	LNA	LNA :
4.5 Prime Focus Instrument	JPL	JPL/Subaru
4.6 System Software	UKATC	UK
4.7 Metrology/calibration	UCL	UK/JPL/Subaru
5.0 Integration & test	JPL	JPL/Marseille/Subaru
6.0 Data System	UKATC	UK

何故 Cambridge Spectrograph を止めたいか？



何故 New CCD を止めたいか？



PFS Performance

- ***throughput budget***
- WFMOS team-B design is extremely aggressive

	@790nm	
Misalignment PFS/PFU	**0.98**	**high**
Fiber Positioners	**0.89**	**keep**
Fiber System	**0.68**	**improve ?**
Spectrograph	**0.689**	**aggressive**
CCD QE	**0.997**	**too high**
DE Instrument throughput	**0.40**	**aggressive**
DE Total throughput	**0.21**	**keep !?**

Where are we?

Today

$1=¥100

- Awarded $27M + $2M "boost"
- $12.5M committed to HSC
- $16.5M available for PFS
- part of the overhead $5M will come back to the project (see later)
- *cf.* WFMOS cost estimate was $68.5M

Murayama July 2010

WFMOS cost

- Total cost $68.5M
- At our disposal $16.5M
- Asked Seiffert (JPL) for revised estimate
- without high dispersion, WFMOS is $56.3M, including overhead and reserves (20%)
- instrument itself is $33.9M +reserve $7.4M

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Possible?

- Current strategy for the instrument:
  - Japan (detector and integration): $16.5M
  - French labor: $5M
  - Caltech/JPL fiber positioner: $10M
  - Brazil fiber: $5M
  - UK metrology+software: $5M
- total: $41.5M
- WFMOS-based estimate: $33.9M

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Boundary Conditions

- 「最先端」終了時：2014年3月時点
  - ⇒ 装置がとりあえず“出来た”
  - ⇒ partial (engineering) First Light
  - ⇒ fibers 敷設と床張完了、N positioner と N/(400-500) 分光器。望遠鏡時間へのimpact を minimize
- Full spec. 装置の完成
  - = Survey 開始 : >2016年
  - ⇒ HSC Survey の完了と密接に関連

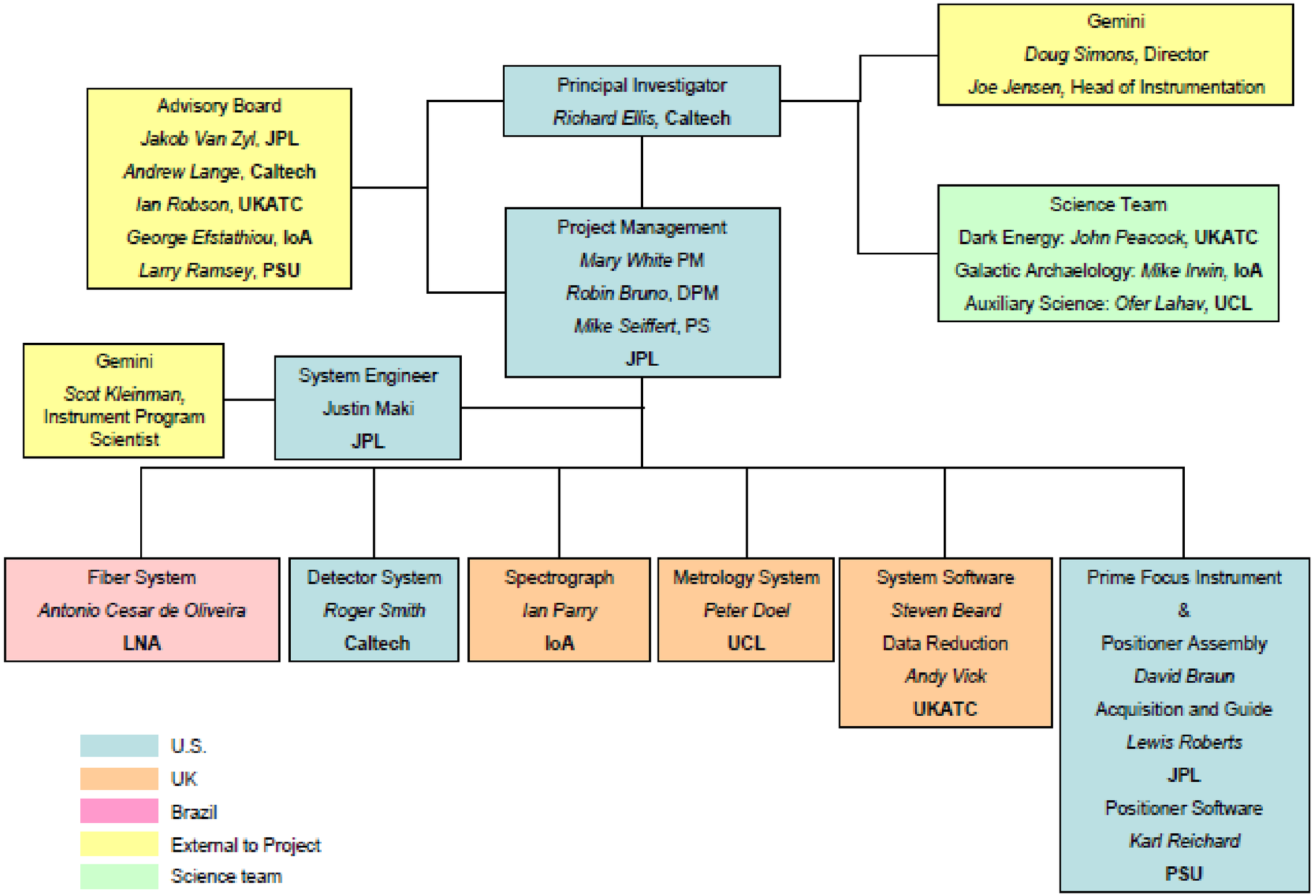


Figure 7.0-1: WFMOS Organization Chart

SuMIRe/PFS Organization

Science Steering Committee
(Subru Advisory Committee)
(Representatives of International Partners)

Hitoshi Murayama
PI of the FIRST Program

International Board
Hiroaki Aihara, IPMU
Richard Ellis, Caltech
Anne Ealet, LAM
Gim Gunn, Princeton
UK, Brazil,... NAOJ

Y. Suto, M. Takada
Science Coordinator

PSF Science Team
IPMU/U. -Tokyo/NAOJ
Other Japanese Universities
Caltech/JPL
LAM/CPPM
Princeton
Other International Partners

Hiroshi Karoji, PM
Mike Seiffert, PS
KT, system engineer
Akitoshi Ueda/optics
NT, MI @ Subaru
PostDoc A
PostDoc B

Positioner & Prime Focus Instrument
JPL

Fibers & Connectors
Brazil

Detectors & Read-out Electronic
Princeton

Spectrograph
LAM

Metrology & System Software
UK

Data Acquisition Reduction Pipeline Software
UK

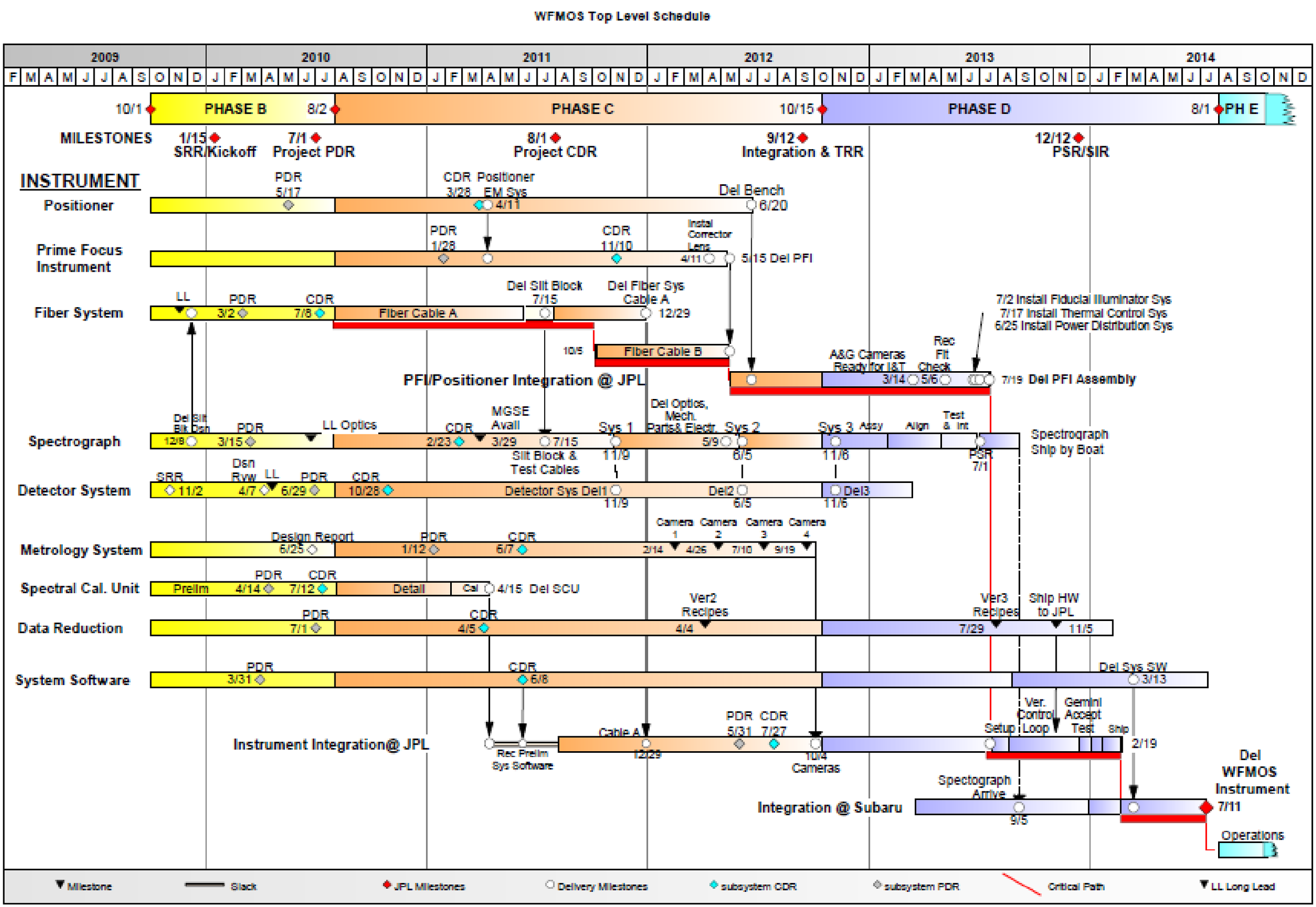
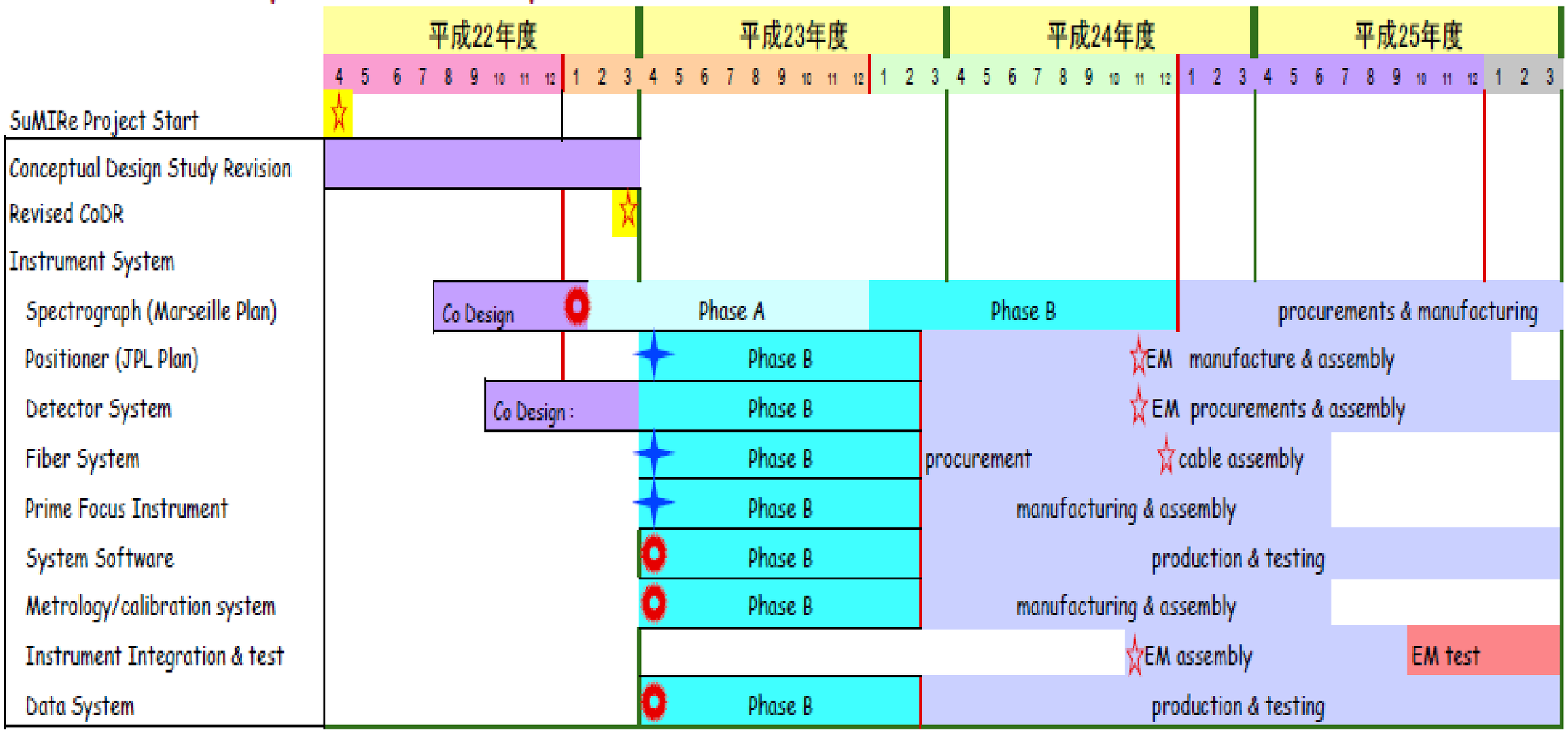


Figure 7.3-1: Top Level Schedule

Ideal Schedule as of Sep. 2010: The PM's Perspective



DE以外のサイエンス

- 2nd arm は最初から作る

  ⇒ 395-600nm or 1.0-1.3μm ?

- High Dispersion (20,000-40,000)は容易に後付け可能とする

  ⇒ “Fiber Selector”
  from N to N/100-200?